Part I

// Checking the Baseline

TOOL 1

RESOURCE STOCKS IN YOUR HEI'S ECOSYSTEM

Question

What are the most important resources in your HEI?

Complexity

low

Completion time

120 minutes

Materials

Pen & paper, flipchart

Note

Monitoring and measuring the stocks of different resources (means) in a specific ecosystem rather than the flows of goods and services makes progress made over long periods visible

What is it for?

The tool 'Resource Stocks in HEI's Ecosystem' envisages helping you and your organisation make well-informed decisions considering available resources. Also, it will assist you in better understanding your HEI's most important resources.

How to use it?

Start by collecting ideas about what resources should be considered important and what stocks should be assessed as suitable as representatives for SD at your HEI. Your answers will depend on your regional ecosystem, including regional SD challenges, the type of HEI, its structure and organisational culture.

The identified resources should be categorised into two major groups — natural capital and anthropogenic capital — and further divided and made measurable by 'representative resource stocks'. While natural capital refers to the stock of natural resources and ecosystem functions, anthropogenic (man-made) capital comprises manufactured, human, social and knowledge capital.

The regular measurement of the stocks must then take on two forms: (1) Measuring and reflecting on current paths and (2) evaluating the impact of future pathways.

Resource Group	Specific Resource Group at HEI	General List of Representative Stock Resources
Natural Capital		
Ecosystems	Number of students, education with SD focus, collaborations	Biomass, biodata, communities
Environment	Land use, population	Climate, quality and quantity of land, air, water
Minerals	Fossil fuels for university operations, transportation	Fossil fuels, iron, sand
Anthropogenic Capital		
Manufactured Capital	Number of green buildings, renewable energy, alternative transportation	Roads, buildings, infrastructure
Human Capital	Skilled individuals	Campus communities (incl. external stakeholders) health, educational level, distribution
Social Capital	Regulations on resource usage, incentives for participation, accessibility, inclusion	Institutions include rules, norms, rights, culture, networks, etc.
Knowledge Capital	Diversity, entrepreneurial and sustainability-related skills, Transdisciplinarity	Indigenous, practical, scientific

Example: Resources Stocks for Well-being in HEIs Ecosystems

Further reading

Clark, William C. & Harley G. A. (2020). Sustainability Science: Toward a Synthesis. **Annual Review of Environment and Resources,** 45, 331-386.
https://doi.org/10.1146/annurev-environ-012420-043621

Resource Group	Specific Resource Group at HEI	General List of Representative Stock Resources
Natural Capital		
Ecosystems		
Environment		
Minerals		
Anthropogenic Capital		
Manufactured Capital		
Human Capital		
Social Capital		
Knowledge Capital		
Resource Group	Specific Resource Group at HEI	General List of Representative Stock Resources

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TOOL 2
TRANSFORMATION MODES

Question

How open is your organisational culture towards transformation?

Complexity

high

Completion time

1 day

Materials

Pen & paper, flipchart

Note

Make sure to talk to members of each important subsystem/impact area within your HEI.

What are 'Transformation Modes'?

'Transformation Modes' describe four different awareness modes of HEIs and their subsystems, such as administration, faculties and other core areas, concerning trans-formation, including SD. Different subsystems can display different transformation modes. For example, the development task of university administrations is predomi-nantly seen as moving from mode 1.0 to mode 2.0 and professionalising processes to a greater extent. The modes must be viewed as parallel developments, possessing an additive character. To transform itself, a HEI has to go through each modus.

What is it for?

Depending on their modus, HEIs react differently to the challenge of SD in their core areas of research, education, outreach and partnering, governance, campus operations and entrepreneurial activities. Knowing which modus applies to which subsystem within your HEI helps you to:

- Find a way to motivate stakeholders from each subsystem by providing the right incentives.

- Work on a shared vision of SD – a prerequisite for all strategic SD activities, entailing values, beliefs and narratives.

How to use it?

The table can be used to get an overview of the four different transformation modes of HEIs. Read the information provided for each modus carefully. Try to talk to representatives of the various subsystems, for example, deans, and look at the subsystems' strategic plans to figure out which modus they belong to. After that, you can decide which elements are needed for transformation towards an integrative and more sustainable HEI that takes on social responsibility.

Further reading

Giesenbauer, B. & Müller-Christ, G. (2020). University 4.0: Promoting the Transformation of Higher Education Institutions toward Sustainable Development. **Sustainability,** 12(8), 3371. https://doi.org/10.3390/su12083371

Example: HEIs Mode of Transformation

	Traditional HEI (Order Thinking)	Modern HEI (Success Thinking)	Postmodern HEI (Considerate Thinking)	Integrative HEI 4.0 (Systems Thinking)
General Focus	• Input, authority and hierarchy; providing knowledge	• Number-oriented optimisation, Output, efficiency and competition	• Dialogue with (internal) stakeholders and learners (especially students), transfer thinking, addressing socio-ecological issues	• Systematic solutions, co-creativity and sustainability
Education	• Teacher centric • Memorising standardised knowledge • Learning for recognition and academic titles	• Test-centric • Disseminating factual knowledge, analytical strategies and sound methods • Modules and projects • Learning and competitive game for future success	• Learner-centric • competencies-oriented transfer of self-reflective knowledge • Focus on dialogical seminars and project-based learning • Blended learning • Learning as personal growth	• System-centric, holistic • Whole-person approach • Dynamic balance between subject matter, group, individual learners and context • Research-based learning • Co-creative and mindful learning
Research	• Search for absolute truths • Self-concept: observing universal natural laws • Focus on solid theories based on both deduction and induction • Construction of disciplines	• Disciplinary research, standardisation of research, processes and peer review • Self-concept: testing and applying natural laws • Competition for grants • Measurement of success with rankings, impact factors, etc. • Focus on quantitative methods	• Inter- and transdisciplinary • Action research • Self-concept: Understanding social dynamics • Dialogical research processes dealing with societal issues • Integration of qualitative research methods	• Transdisciplinarity • Co-creative research • Self-concept: co-creating systemic transformation • Global action university • Living lab approach • Focus on real-life solutions • Idea of open science
Governance, Operations and Culture	• Focused on teaching, primary research and technological transfer • Building palaces of knowledge: impressive buildings and extensive libraries • Legitimacy by authority • Compliant by regulation, e.g., waste management and safety • One-dimensional approach to sustainability	• Focused on quantitative growth • Rapid growth in functional buildings with little energy awareness • Control of cash flows and process management • Entrepreneurial activity • Science parks • SD as a management task	• HEI as a place of meeting diverse yet like-minded people • Facilitating community and individual expression • Diversity management • Legitimacy by participation • Goal of climate neutrality • SD as a community task and third mission content	• HEI as space for encounter reflection and inspiration • Physical and virtual integration of different societal and ecological systems • Whole-institution approach to sustainability • Additional fourth mission: co-creation for sustainability

Subsystems of your HEI	Traditional HEI (Order Thinking)	Modern HEI (Success Thinking)	Postmodern HEI (Considerate Thinking)	Integrative HEI 4.0 (Systems Thinking)

TOOL 3
STAKEHOLDER MATRIX

Question

What are the roles and responsibilities of your key actors?

Complexity

medium

Completion time

6 hours

Materials

Pen & paper, flipchart

Note

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What is it for?

Promoting sustainable development in higher education institutions requires collaboration and commitment from various stakeholders. 'Stakeholder Matrix' is a great tool for getting an overview of the roles and responsibilities of different key actors in the implementation process of SD at HEIs.

How to use it?

First, get an overview of critical internal stakeholders and trailblazers for SD at your HEI. After that, a colour code (red, yellow, green) will help you to assign each key actor their role and responsibility within the seven steps of the SD implementation process.

Stakeholder Matrix

	Formulating SD Vision	Mapping SD Activities	Linking SD Activities to SDG Targets	Mapping Governance & Capacities	Analysing Regional Challenges or Potentials	Visualisation & Alignment	Gap Analysis
Lead Personal	🟥						
Educators	🟩						
Non-Academic Staff	🟩						
Sustainability Officers	🟨						
Researchers	🟩						
Deans	🟩						
Students	🟩						

Colour coding: 🟥 Initiator(s) of a step   🟨 Lead in carrying the step out   🟩 People actively involved in the implementation

TOOL 4
MAPPING CAPACITIES

Question

What capacities do you need to successfully implement SD activities?

Complexity

medium

Completion time

6 hours

Materials

Pen & paper, flipchart

Note

Not every HEI possesses every capacity. Focus on the most important SD activities to see what capacities need to be developed further.

What is it for?

'Mapping Capacities" is a tool for mapping the skills and capacities available as well as the governance and the modes of governing in the HEI and matching them with the necessary capacities to act towards SD effectively. Different SD activities require different (institutional) capacities for the strategic implementation of SD at HEIs.

By highlighting the critical capacities of a measure in a core area, key stakeholders can be identified, and governance measures can be planned.

How to use it?

After getting an overview of the activities already being conducted in your institution, HEIs must analyse how these activities relate to the six capacities of transformative HEIs. The capacities include adaptability, measuring progress, transformation, transfer, governing and promoting equity. The linking is done by drawing lines from the

activities in the different core areas on the left side to the most important related capacities on the right side of the graphic. For example, entrepreneurial support depends on a HEI's transfer capacity ('praxis'), while 'education' and 'research' impact the capacity to 'promote equity'.

By looking at SDS4HEI Framework Part II, you can also analyse the different variables that make up a capacity to figure out what your HEI needs to work on to strengthen or develop a needed capacity. The following figure illustrates the linkages between activities mapped capacities.
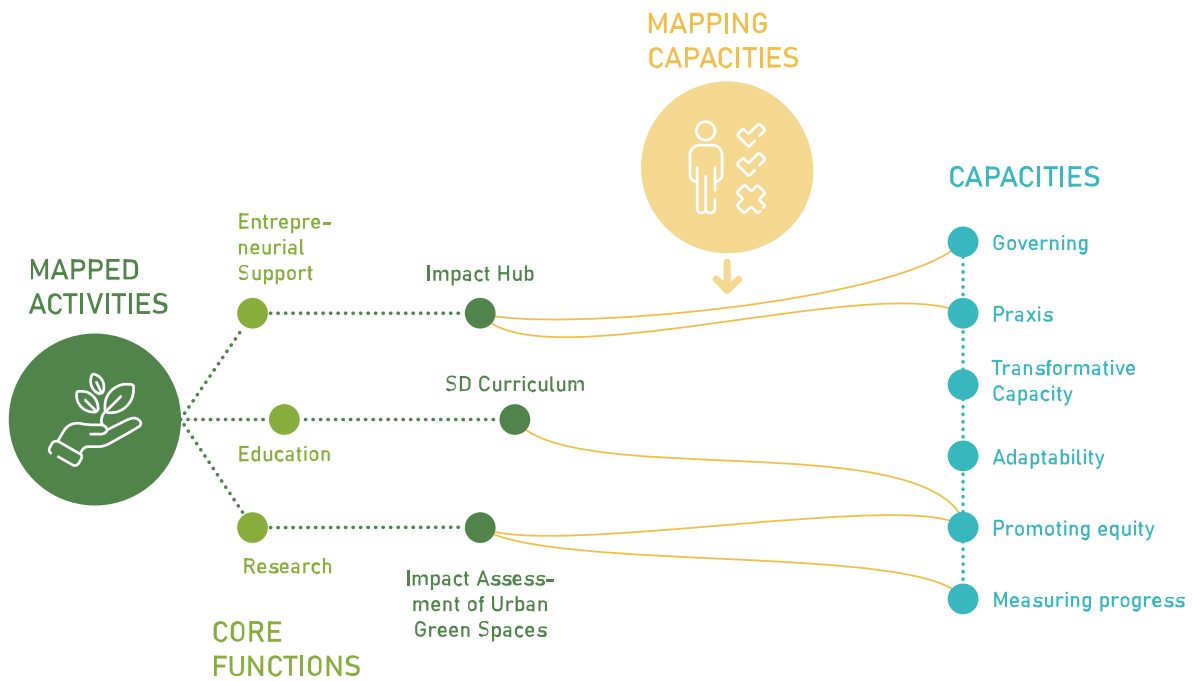
TOOL 5

SIX STEPS TOWARDS SD MEASUREMENT

Question

How can you start measuring progress?

Complexity

high

Completion time

1 day

Materials

Pen & paper or flipchart

Note

Try collaborating with a small group of internal stakeholders with diverse backgrounds to discuss SD and go through the steps.

What is it for?

"The 'Six Steps Towards SD Measurement' serves as a roadmap for individuals and institutions interested in initiating the measurement of SD progress. These six steps aid in developing the essential skills that impact your HEI's capability to measure progress effectively.

How to use it?

Take your time to go through each of the following six steps:

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Step 1: Choosing Central Goals

As a first step, HEIs must define their central goals. The SDG targets can be used as an orientation and align with an institution's strategic plans or the potentials and challenges identified in the 'contextual frame'.

Step 2: Defining Relevant Resources

Subject to the respective contextual frame, i.e., the ecosystem in which the HEIs are situated, HEIs must decide on meaningful representative stock resources in the two main categories: (1) natural capital and (2) anthropogenic capital.

Step 3: Finding Meaningful Indicators

To gauge resource stocks, HEIs must establish measurement systems with useful indicators. Data needs to be at hand and cover all dimensions. However, many HEIs concentrate their measuring and reporting efforts on the environmental dimension of SD. Informative indicators need to be meaningful (represent information), relevant (reflective), direct (closely measure change), objective (have a clear operational definition of what is being measured and what data need to be collected), reliable, helpful, understandable (easy to comprehend and interpret) and practical. Aspects such as data collection costs and time resources are inhibiting factors.

Step 4: Evaluating Impact

One of the biggest challenges for HEIs is making the impact of their SD efforts visible and measurable. Deciding on specific SDG targets makes progress more concrete and impact more visible within a region. Developing a 'Theory of Change' linking impacts to activities, outputs, and outcomes can assist in doing so.

Step 5: Adopt an Integrative Perspective

HEIs can perceive all relevant resources as part of a particular context. They can determine the social value represented by resource stocks, move beyond single resources and asses the interactions between the different resource categories.

Step 6: Evaluate Governance Structures

Finally, HEIs should be able to evaluate the efficacy of new governance arrangements and mechanisms, for they are essential for managing and measuring resources.